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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/962,362	10/31/1997	NOBUYUKI KAMBE	2950.08US01	8780

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PETER S. DARDI  
PATTERSON, THUENTE, SKAAR & CHRISTENSON, P. A.  
4800 IDS CENTER  
80 SOUTH 8TH STREET  
MINNEAPOLIS, MN 55402-2100

EXAMINER
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GUHARAY, KARABI

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	08/962,362	KAMBE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Karabi Guharay	2879	

-- The MAILING DATE of this communication appears in the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on Amendment, filed on 01/05/04.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6,20-30 and 32-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,20-30 and 32-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>01/05/04</u> . | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 2879

Amendment, filed on 01/05/04 has been considered and entered.

Claim 1 has been amended.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6, 20-30, 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jaskie (US 5442254) further in view of Bhargava (US 5455489).

Referring to claims 1, 4, and 5, Jaskie discloses a display (see FIG. 5) comprising phosphor particles (fluorescent layer 53) having an average diameter less than 95 nm (see abstract, 10 nm particles) wherein the particle size is selected to yield light in a desirable portion of the spectrum. Jaskie is silent as to the particular range of phosphor particles. Jaskie teaches, however, that the specification of a desired particle range is within the skill of the art. See col. 7, lines 34-40. It would have been obvious to specify a desired particle range because the specification of a desired particle range is generally recognized to be within the skill of the art. Furthermore Jaskie does not exemplify that phosphor particle comprises metal oxide. However, Bhargava teaches that metal oxide particles such as ZnO (group II-VI, semiconductor), ZnS, and Y<sub>2</sub>O<sub>3</sub> (see col. 2, lines 4-32), are all suitable for quantum contained phosphors, such as desired by

Art Unit: 2879

Jaskie. It would have been obvious to select ZnO, ZnS, and  $Y_2O_3$ , phosphors as disclosed by Bhargava, in the display, as disclosed by Jaskie, because the selection of known materials for a known purpose is within the skill of the art.

Still referring to claims 1, 4, and 5, substituting an average diameter of 5 nm as recited in claim 4, into the narrower range of particle sizes as recited in claim 5, yields a range of particle sizes of from 3 to 7 nm. Now referring to column 6, lines 46-49, Jaskie teaches that yellow light is produced from particles having a size of approximately 5 nm. Jaskie further teaches that the energy of a photon is inversely proportional to wavelength (col. 1, line 52-55), and inversely proportional to the size of the phosphor particle (col. 4, line 40-44). Taking yellow light to be the band from 597 to 577 nm and using the equations provided in column 1, line 52-55, and column 4, line 40-44 yields the yellow phosphor having the size from 5.04 to 4.95 nm, i.e., approximately 5 nm, as disclosed by Jaskie. Similarly, substituting the wavelength range of visible light from 400 to 800 nm, yield a particle distribution of from 4.14 to 5.84 nm, which is within the claimed range from 3 to 7 nm. Consequently, it is the position of the examiner that it would have been obvious to one skilled in the art that the presently claimed range of sizes reads on the teachings of Jaskie.

Referring to claim 6, Jaskie teaches that the light emission follows low velocity electron excitation.

Referring to claims 2, 3, 33, the selection of known materials for a known purpose is generally considered to be within the skill of the art. Bhargava teaches that ZnO (group II-VI, semiconductor), ZnS, and  $Y_2O_3$  (see col. 2, lines 4-32), are all suitable for quantum contained phosphors, such as desired by Jaskie. It would have been

Art Unit: 2879

obvious to select ZnO, ZnS, and Y<sub>2</sub>O<sub>3</sub>, phosphors as disclosed by Bhargava, in the display, as disclosed by Jaskie, because the selection of known materials for a known purpose is within the skill of the art.

Referring to claims 20, and 21, FED displays conventionally include a plurality of phosphors for generating red, blue, green light (see for example Clerc, FIG. 6, RGB phosphors 28), and anodes 28.

Referring to claims 22, 23, see col. 1, line 26; FIG. 5, faceplate 52.

Claim 24, and 27 are rejected for the same reason as claim 21.

Referring to claim 25, see FIG. 4, focus grid 59.

Claim 28 is rejected for the same reason as claims 20, 21.

Referring to claims 29 & 34, see FIG. 2, and col. 6, line 48.

Claim 30 is rejected for the same reason as claim 6.

Referring to claim 26, Jaskie does not disclose an EL display. Bhargava teaches that quantum confined phosphors provide EL displays (see FIG. 15) with higher efficiency (see col. 9, lines 46-67). It would have been obvious to include the quantum-confined phosphors, as disclosed by Jaskie, in the EL display, as disclosed by Bhargava, for higher efficiency.

Regarding claim 32, Jaskie does not explicitly exemplify that average particle diameter is about 15nm to 100nm, however it has been held that discovering an optimum value of a result, effective variable involves only routine skill in the art.

### ***Response to Arguments***

Applicant's arguments, presented on January 05, 2004, are considered but they are not persuasive.

Applicant argued that neither reference describes how to produce particles with the claimed characteristics.

Indeed, Jaskie discloses method for quantum-contained particles.

Regarding applicants same allegation presented before regarding Jaskie's wet filtering process is not enabling, examiner respectfully direct applicant to see examiner's answer provided on January 30, 2001. Upon consideration of all the evidences in this case including applicant's arguments and the decision rendered by the Board of Patent Appeal, examiner concurs with the decision of Board of Patent Appeal.

Further applicant contends that Bhargava patent only refers specifically  $Y_2O_3$ . Examiner respectfully disagrees. Bhargava teaches wide band Group II-VI semiconductors as host phosphor, which includes ZnO.

R.N. Bhargava in US # 5422907, & US # 5446286, specifically discloses ZnO along with ZnS and CdS, as examples of wide band group II-VI nano-crystal semiconductors.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

#### ***Other Prior Art Cited***

The prior art made of record and not relied upon is considered pertinent to

Art Unit: 2879

applicant's disclosure : Bhargava (US 5422907); Bhargava (US 5446286); Potter (US 5965192); Potter (US 6015326); Potter (US 6254805).

**Conclusion**

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

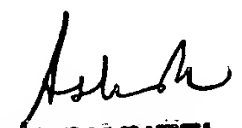
**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is (571) 272-2452. The examiner can normally be reached on Monday-Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Karabi Guharay  
Karabi Guharay  
Patent Examiner  
Art Unit 2879

  
ASHOK PATEL  
PRIMARY EXAMINER